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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/802,168

03/17/2004

Yoshiteru Tsuchinaga

FUJY 21.045

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26304

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04/07/2009

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EXAMINER

HAN, QI

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

04/07/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/802,168	Applicant(s) TSUCHINAGA ET AL.	
	Examiner QI HAN	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/25/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Information Disclosure Statement

3. The references listed in the Information Disclosure Statement submitted on 03/25/2009 have been considered by the examiner (see attached PTO-1449).

Response to Amendment

4. This communication is responsive to the applicant's amendment and RCE both filed on 02/17/2009. The applicant(s) amended claims 1-3, 5-8 and 10 (see the amendment: pages 2-8).

The examiner withdrew the claim objection, because the applicant amended the corresponding claim(s).

Response to Arguments

5. Applicant's arguments filed on 03/07/2006 with respect to the claim rejection 35 USC 103, have been fully considered but are moot in view of the new ground(s) of rejection, since the amended claims introduce new issue and/or change the scope of the claims.

It is noted that since the applicant's arguments (see Remarks: pages 9-10) are based on the newly amended claims, the response to the arguments is directed to the corresponding claim rejection (see below).

It is also noted that the previous cited references are still applicable to the amended claims with new ground(s) for the prior art rejection (may includes new teachings of the combined references, see detail below).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is noted that the first limitation element includes four codes for the judgment, while the second limitation element only includes three codes (i.e. missing "gain code"). It is unclear or confused that why needs a gain code for the judgment if it is on use for embedding, so that the claim is indefinite.

Regarding claims 2-10, the rejection is based on the same reason described for claim 1, because the claims include/inherit the same or similar problematic limitations as claim 1.

Claim Rejections - 35 USC § 103

7. Claims 1, 3, 5-6, 8 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by GOPALAN et al. (US 2003/0176934 A1) hereinafter referenced as GOPALAN in view of WU et al. (“Fragile speech watermarking based on exponential scale quantization for temper detection”, Acoustics, Speech , and Signal Processing, 2002, Proceeding IEEE international conference) hereinafter referenced as WU.

As per **claim 1**, as best understood in view of the rejection under 35 USC 112 2nd (see above), GOPALAN discloses ‘method and apparatus for embedding data in audio signals’ (title), for ‘Linear Predictive Code (LPC)-10 model (speech encoding/decoding method including coding/decoding speech code)’ (p(paragraph) 25), comprising:

“an embedding judgment unit, for every speech code, to judge whether or not a speech code is capable of embedding data based on a liner spectrum [pair (LSP)] code, a pitch lag code, [a fixed code and a gain code] included in a [past] speech code output from a [code excited] linear prediction encoder” (Fig. 1 and p12, mechanism for ‘computing the masker frequencies and their power levels on frame-to-frame (corresponding to every speech code) basis; determining (judge) a global threshold of hearing at each said masker frequency... obtaining the sound pressure level for quiet, below which a signal is inaudible (to judge whether or not a speech code is capable of embedding data)’; p25, ‘Linear Predictive Code (LPC)-10 model

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(inherently including liner spectrum and pitch codes as its parameters)'; also see Fig. 1, '155', p22); and

"an embedding unit to embed data to be embedded in a part of [a LSP code], a pitch lag code and [a fixed code], defined as embedding object parameter codes, among a speech code for which it is judged by the embedding judgment unit that a speech code is capable of embedding data, wherein the embedding unit replaces the embedding object parameter codes with the data to be embedded", (p10, a mechanism for 'embedding binary data (embedding data) in audio signal', 'the magnitude (parameter coder corresponding to embedding object parameter codes) of the power spectrum at the perceptual holes of each frame of a host speech utterance' and 'phase spectrum (parameter code) at perceptually masked spectral points of each frame of a host speech utterance', 'may be altered (replaced) so as to embed digital data'; p25, 'Linear Predictive Code (LPC)-10 model', 'DCT' and Fourier-Bessel coefficients (each of them corresponds a parameter code), may be used for embedding'; p5, 'replacement of spectral components...with the sequence to be embedded'; also see Fig. 1, p23 and p26-p27).

GOPALAN does not expressly disclose a **past** speech code. However, it is noted that, as stated above, GOPALAN discloses '**replacement** of spectral components (corresponding to the embedding object parameter codes) ...with the sequence (corresponding the data) to be embedded' (p5) and using LPC-10 model for embedding p23, so that one of ordinary skill in that would have readily recognized that these teachings would suggest that there would be a past speech code (in a broad sense) first and then use it for the replacement, and the LPC-10 model could be used for providing the past speech code, which would be within the scope of capability of the skilled person in the art and the result would be predicable.

Further, GOPALAN does not expressly “a code excited linear prediction (CELP) encoder” with “an LSP code”, “a fixed code” and “a gain code” for embedding. However, the feature of embedding data in CELP encoders is well known in the art as evidenced by WU who discloses algorithms of embedding watermark data in certain regions, such as selected frequency components and/or compression coefficients, including part of coefficients of CELP coders, such as ‘LSP coefficients and the lag of pitch’ among all coefficients of G.327.1 and GSM-AMR (page 3306, right column, p1-p3 and page 3307, left column, p2). One of ordinary skill in the art would have readily recognized that CELP (such as G.327.1 or GSM-AMR standards) coder (encoder) would have inherently include fixed code and gain code among its parameter codes, and portions of these CELP parameter codes (such as LSP coefficients, pitch lag, fixed code and gain code) would be used for embedding data including but not limited in watermark data, because embedding different data in different parameter codes would be based on the same/common principle that would preserve both perceptively high quality on embedded data (such as speech) and high integrity on embedding data (such as watermarks). Further, one of ordinary skill in the art would have recognized that the CELP coder of WU (page 3306, right column, p2) is later developed version of Linear Predictive Code (LPC) coder of GOPALAN (p25), and both parameters of power amplitude spectrum in GOPALAN and LSP coefficients in WU would reflect the same acoustic characteristic of speech (i.e. vocal track characteristic), so that combination of teachings (including inherent the feature) GOPALAN and LSP would be obviously within the capability/knowledge of the ordinary skilled person, and the result would be predictable when using the CELP coder instead of LPC-10 coder and using LSP coefficients instead of amplitude of power spectrum (or Fourier-Bessel coefficients, GOPALAN: p25).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify GOPALAN by providing embedding data by using CELP coder with its parameters (such as portion of LSP, pitch, gain code, fixed code), as taught/suggested by WU, for the purpose (motivation) of providing transparent authentication with performing content preserving operation and/or using suitable (such as stable) coefficients for embedding data applications (WU: abstract; page 3306, right column, p2).

Furthermore, it is noted that the applicant argued that because WU's stated that "we observe that only the LSP coefficients and the lag of pitch predictors are stable enough among all coefficients of G. 723.1" (see WU at page IV-3306, right column)", "WU teaches away from the feature of the embedding unit to embed data into not only a part of a LSP code and a pitch lag code but [not] also a fixed code." However, the examiner has a different view of the prior art teachings and the claim interpretations. It should be pointed out that, based on the WU's disclosure, one of ordinary skill in the art would have recognized and/or concluded that the parameters (codes) of LSP and pitch would be more **stable** than other parameter of G. 723.1, so as to be chosen as most preferred codes for embedding; and the other parameters of G. 723.1 including fixed code and gain code might not be stable enough, so as being used as a least choice for embedding (but not means to refuse to use them at all). In addition, in another view, even if the data is determined (judged) to be embedded in a part of LSP code (and/or a part of pitch) **only** as WU expressly disclosed, the combined rejection can still be properly read on the claimed limitation of "to be embedded in a part of a LSP code, a pitch lag code and a fixed code", based on the broadest reasonable interpretation of the claimed language, in light of specification (see Fig. 9).

As per **claim 3**, it recites a data extraction device that simply performs the reversed operations of claim 1. The rejection is based on the same reason described for claim 1, because it also reads on the limitations of claim 3 (see GOPALAN: Fig. 1, '200-220').

As per **claim 5**, it recites a data embedding/extraction device. The rejection is based on the same reason described for claims 1 and 3, because the claim recites the same or similar limitation(s) as claims 1 and 3.

As per **claims 6, 8 and 10**, they recite methods. The rejection is based on the same reason(s) described for apparatus claims 1, 3 and 5 respectively, because the method claims and apparatus claims are related as apparatus and method of using same, with each claimed element's function corresponding to the claimed method step.

8. Claims 2, 4, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over GOPALAN in view of WU applied to claims 1, 3 and 6, and further in view of CHIU et al. (US 2004/0220803 A1) hereinafter referenced as CHIU.

As per **claim 2** (depending on claim 1), GOPALAN in view of WU does not expressly disclose "the embedding judgment unit, for every frame defined in accordance with the speech encoding method, judges whether the frame is a frame of a speech section, or a frame of a non-speech section, and the embedding unit executes a process for embedding the data to be embedded in the speech code of the frame of the non-speech section". However, the feature is well known in the art as evidenced by CHIU who discloses 'method and apparatus for transferring data over a voice channel' (title), comprising 'encoding (embedding) data traffic as a transmit voice frame' (abstract and p11-p12), 'detect silence (non-speech section)' and 'insertion

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of a voice frame with data (embedding data in a speech code) and the predetermined vocoder parameter' (p28), 'voice frames with data encoded (embedded) that have been inserted in area where silence or no voice frame (frame of non-speech section) was detected (p32 and Fig. 4), 'LPC vocoder (speech encoding method)' (p35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify GOPALAN in view of WU by providing using silence speech frame for encoding (embedding) data, as taught by CHIU, for the purpose (motivation) of transferring data over a voice channel and embedding data in a voice channel without affecting legacy units or infrastructure equipment (CHIU: p3 and p12).

As per **claim 4** (depending on claim 3), it simply performs the reversed operations of claim 2. The rejection is based on the same reason described for claim 2, because it also reads on the limitation(s) of claim 4.

As per **claims 7** (depending claim on 6) and **9** (depending on claim 8), the rejection is based on the same reason described for apparatus claims 2 and 4 respectively, because the claims recite the same or similar limitations as claims 2 and 4 respectively.

Conclusion

9. Please address mail to be delivered by the United States Postal Service (USPS) as follows:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to QI HAN whose telephone number is (571)272-7604. The examiner can normally be reached on M-TH:9:00-19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QH/qh
March 29, 2009
/Qi Han/
Primary Examiner, Art Unit 2626